



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/471,572	12/23/1999	KENNETH A. JONES	59896/JPW/AD	7623

7590

08/12/2003

JOHN P WHITE ESQ
COOPER & DUNHAM LLP
1185 AVENUE OF THE AMERICAS
NEW YORK, NY 10036

EXAMINER

MURPHY, JOSEPH F

ART UNIT

PAPER NUMBER

1646

DATE MAILED: 08/12/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/471,572

Applicant(s)

JONES ET AL.

Examiner

Joseph F Murphy

Art Unit

1646

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 156-183 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 156-183 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

Art Unit: 1646

DETAILED ACTION

Formal Matters

Claims 77 and 141 were canceled and claim 159 was amended in Paper No. 12, 5/21/2003. Claims 156-183 are pending and under consideration.

Response to Amendment and Arguments

Applicant's arguments filed in Paper No. 10, 5/21/2003 have been fully considered but they are persuasive in part.

The rejection of claims 156-183 under 35 USC § 103(a) as being unpatentable over Conklin et al. (1996) in view of Milligan et al. (1999) and further in view of Silva et al. (1990) has been withdrawn.

Remaining issues are set forth below.

Claim Rejections - 35 USC § 112 first paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 159 stands rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention, for reasons of record set forth in Paper No. 8, 2/8/2002 and Paper No. 10, 11/19/2002.

Art Unit: 1646

The rejection of record set forth that due to the limitation of "genomic DNA" recited in the claim, a determination of what the claim as a whole covers indicates that elements which are not particularly described, e.g. promoters, enhancers, untranslated regions and introns, are encompassed by this claim. There is no actual reduction to practice of the claimed invention, or complete detailed description of the structure. A biomolecular sequence described only by a functional characteristic, in this case an isolated genomic nucleic acid encoding a chimeric G protein, without any known or disclosed correlation between that function and the structure of the sequence is not a sufficient identifying characteristic. See *University of California v. Eli Lilly and Co.* 43 USPQ2d at 1406. There is no known or disclosed correlation between this function and the structure of the non-described regulatory elements and untranslated regions of the genomic DNA. Weighing all factors in view of the level of knowledge and skill in the art, one skilled in the art would not recognize from the disclosure that the Applicant was in possession of the claimed invention.

Applicant argues that the claim, as amended, does not cover those elements associated with genomic DNA such as promoters, enhancers, UTR's and introns, and that the amended claim covers only coding sequence, because of the closed language used in the claim. However, genomic DNA consists of promoters, enhancers, UTR's and introns, as well as the nucleotides encoding the chimeric G protein. For example, Alberts et al. *Molecular Biology of the Cell*. 1989, Garland Publishing, Inc. New York, pages 183 and 534 sets forth that there is an important difference between genomic and cDNA clones, in particular because of the extensive RNA splicing that occurs in higher eucaryotes only cDNA clones are likely to contain an uninterrupted form of the nucleotide sequences that code for proteins (see page 183, fourth paragraph). This is

Art Unit: 1646

demonstrated on page 534, Figure 9-81 which shows that a genomic clone of a eukaryotic gene contains introns, which were not described in the specification. Closed language in a claim drawn to a nucleic acid excludes sequence outside the claimed stretch, it does not exclude sequences that would normally be found within the claimed nucleic acid sequence. Thus the claim does not only cover the coding sequence, it still encompasses elements that are not particularly described, e.g. promoters, enhancers, untranslated regions and introns, thus the rejection is maintained.

Claims 156-183 stand rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention, for reasons of record set forth in Paper No. 8, 2/8/2002 and Paper No. 10, 11/19/2002. Applicant is directed to the Guidelines for the Examination of Patent Applications Under the 35 U.S.C. 112, ¶ 1 "Written Description" Requirement, Federal Register, Vol. 66, No. 4, pages 1099-1111, Friday January 5, 2001.

The rejection of record set forth that these are genus claims. According to the specification, the term variant means a protein having one or more amino acid substitutions, deletions, insertions and/or additions made to SEQ ID NO: 1. The specification and claim do not indicate what distinguishing attributes shared by the members of the genus. The specification and claim do not place any limit on the number of amino acid substitutions, deletions, insertions and/or additions that may be made to SEQ ID NO: 1. Thus, the scope of the claim includes numerous structural variants, and the genus is highly variant because a significant number of structural differences between genus members is permitted. Although the specification states that

Art Unit: 1646

these types of changes are routinely done in the art, the specification and claim do not provide any guidance as to what changes should be made. Structural features that could distinguish compounds in the genus from others in the protein class are missing from the disclosure. No common structural attributes identify the members of the genus. The general knowledge and level of skill in the art do not supplement the omitted description because specific, not general, guidance is what is needed. Since the disclosure fails to describe the common attributes or characteristics that identify members of the genus, and because the genus is highly variant, SEQ ID NO: 1 alone is insufficient to describe the genus. One of skill in the art would reasonably conclude that the disclosure fails to provide a representative number of species to describe the genus. Thus, applicant was not in possession of the claimed genus.

Applicant argues that the specification provides six examples of nucleic acids encoding chimeric $G_{\alpha q}$ proteins comprising an invertebrate $G_{\alpha q}$ backbone and vertebrate C-terminal portion. However, five of these comprise a $G_{\alpha q}$ backbone from *C. elegans*, and one comprises a $G_{\alpha q}$ backbone from *D. melanogaster*. The further examples of how to make invertebrate-vertebrate $G_{\alpha q}$ chimeras are also all from *C. elegans*. Thus, while the claims encompass nucleic acids encoding a chimeric G protein which comprises a $G_{\alpha q}$ backbone from any invertebrate $G_{\alpha q}$, the specification provides description only from two species of invertebrates. As set forth in the Office action of Paper No. 10, 11/19/2002, the written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice, reduction to drawings, or by disclosure of relevant identifying characteristics, i.e. structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between structure and function

Art Unit: 1646

structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus. Here Applicant has provided description of chimeras comprising invertebrate $G_{\alpha q}$ from only two species, while the claims encompass nucleic acids encoding chimeric proteins comprising $G_{\alpha q}$ proteins from any of the thousands of invertebrate species. Applicant further argues that the claims set forth a sufficient structural limitation because the nucleic acid encodes a chimeric where at least five but no more than twenty—one amino acids are deleted and replaced. However, the claims encompass the nucleic acids encoding a chimeric G protein which comprises a $G_{\alpha q}$ backbone from any invertebrate $G_{\alpha q}$ where at least five but no more than twenty—one amino acids are deleted and replaced, while the specification provides description only from two species of invertebrates. The claims encompass potentially thousands of nucleic acids encoding invertebrate $G_{\alpha q}$ chimeric subunits, and this genus is substantially broadened by the claims encompassing anywhere of from five to twenty five deletions and substitutions. Applicant has not provided a sufficient correlation between the structure of the encompassed nucleic acids encoding these chimeric G protein subunits and the function set forth for the encoded chimeric G proteins.

As set forth in the rejection under 35 USC § 112 second paragraph (*infra*), the claims recite that the encoded chimeric G proteins subunits must produce a $G_{\alpha q}$ second messenger response. Since the term $G_{\alpha q}$ second messenger response encompasses such varying responses including, *inter alia*, PLC effects, MAP kinase activation, calcium mobilization, and cAMP elevation, and the definition set forth by Applicant also includes effectors activated by $\beta\gamma$ subunits (see *infra*), there is not a correlation between the encompassed nucleic acids encoding chimeric G protein subunits comprising a $G_{\alpha q}$ backbone from any invertebrate, which must

Art Unit: 1646

produce a $G_{\alpha q}$ second messenger response, when the possible responses which the encoded chimeric must produce are indefinite. Furthermore, the prior art does not provide compensatory structural or correlative teachings sufficient to enable one of skill to isolate and identify the nucleic acids encompassed: there is no guidance in the art as to what the defining characteristics of the chimeric G protein subunits might be. Thus, no identifying characteristics or properties of the instant nucleic acids are provided such that one of skill would be able to predictably identify the encompassed molecules as being identical to those instantly claimed.

Applicant further argues that the specification has provided methods of making and screening for nucleic acids encoding the chimeric G protein subunits. However, *Vas-Cath Inc. V. Makurhar*, 19 USPQ2d 1111, makes clear that applicant must convey with reasonable clarity to those skilled in the art, as the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the written description inquiry whatever is now claimed (see page 1117). The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed. (See *Vas-Cath Inc. V. Makurhar*, page 1116.). The skilled artisan can not envision the detailed chemical structure of the encompassed nucleic acids encoding amino acid sequences and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that is part of the invention and reference to a potential method for isolating it, the amino acid sequence itself is required,. See *Fiers v. Revel*, 25 USPQ2d 1601, 1606 (CAFC 1993) and *Amgen Inc. V. Chugai Pharmaceutical Co. Ltd.* 18 USPQ 2d 1016.

Claim Rejections - 35 USC § 112 second paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 156-176, 179-183 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, for reasons of record set forth in Paper No. 10, 11/19/2002.

The rejection of record set forth that claim 156 is vague and indefinite in the recitation of "produces a $G_{\alpha q}$ second messenger response". The specification on page 29, lines 1-4 defines a " $G_{\alpha q}$ second messenger response" as one of a number of responses which are typically produced by activation of G protein heterotrimers containing $G_{\alpha q}$. However, G proteins upon activation bind to effectors which produce the second messenger response. It is not clear from the claim whether the chimeric $G_{\alpha q}$ protein is to bind an effector and induce a second messenger response, or whether the chimeric $G_{\alpha q}$ protein is to produce a second messenger response itself in some manner. Claims 157-176, 179-183 are rejected insofar as they depend on the recitation of claim 156 of "produces a $G_{\alpha q}$ second messenger response"

Applicant argues that the $G_{\alpha q}$ second messenger response is clear in light of the description and the knowledge of the skilled person. Applicant points out that the specification teaches that a $G_{\alpha q}$ second messenger response is one of a number of responses that are typically produced by activation of G protein heterotrimers containing $G_{\alpha q}$. Applicant further argues that the specification also teaches that a typical response is the activation of PLC isoforms, and that $\beta\gamma$ subunits released from the heterotrimeric G protein may interact with a number of effectors.

Art Unit: 1646

The test for definiteness under 35 U.S.C. 112, second paragraph is whether “those skilled in the art would understand what is claimed when the claim is read in light of the specification.” *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986) see MPEP § 2173.02. In the instant case, the specification sets forth numerous possible $G_{\alpha q}$ second messenger effects, including the aforementioned PLC effects, MAP kinase activation, calcium mobilization, and cAMP elevation, amongst others (Specification at 76-85). It is not clear whether the nucleic acid encodes a chimeric protein that must interact with any of the effectors which produce those responses, or only one of them. Thus the metes and bounds of the claims are unclear. Additionally, Applicant has also argued that those effectors activated by $\beta\gamma$ subunits should also be included in the definition of $G_{\alpha q}$ second messenger effects. Given the large number of possible $G_{\alpha q}$ second messenger effects, those skilled in the art would not be able to determine the metes and bounds of the claimed nucleic acid encoding a chimeric $G_{\alpha q}$. It is also not clear how an effector modulated by $\beta\gamma$ subunits should be considered as part of the $G_{\alpha q}$ second messenger effects, when the encoded chimeric $G_{\alpha q}$ would not affect $\beta\gamma$ subunit interaction with effectors. Thus the phrase “ $G_{\alpha q}$ second messenger effects” is vague and indefinite, and the metes and bounds of the claims cannot be determined.

Conclusion

No claim is allowed.

Art Unit: 1646

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

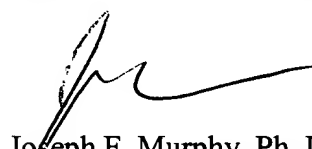
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Advisory Information


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph F. Murphy whose telephone number is 703-305-7245. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler can be reached on 703-308-6564. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-308-0294 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.



Joseph F. Murphy, Ph. D.
Patent Examiner
Art Unit 1646
August 6, 2003



YVONNE EYLER, PH.D.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600